Organizational Results Unit Manual

Missouri Department of Transportation

2006

Organizational Results Unit Manual

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Introduction

Organizational Results is responsible for working with department managers to close performance gaps. This includes coordination of research, development and implementation of business, policy and engineering solutions from strategic direction to individual processes. Special attention is given to identifying best practices, technologies and new products to drive the organization performance.

Purpose Statement

Organizational Results provides support and consultation to the System Delivery Team and the System Facilitation Team toward accomplishing each Tangible Result, and in turn our department's mission.

Organizational Results Structure

Organizational Results is structured to support each of MoDOT's 18 Tangible Results *(Figures 1 and 2)*. Organizational Performance Administrators coordinate the unit's work related to a group of Tangible Results. This includes assisting department managers with performance assessments and strategy development, as well as coordinating staff work.

Figure 1, Structure by Tangible Results

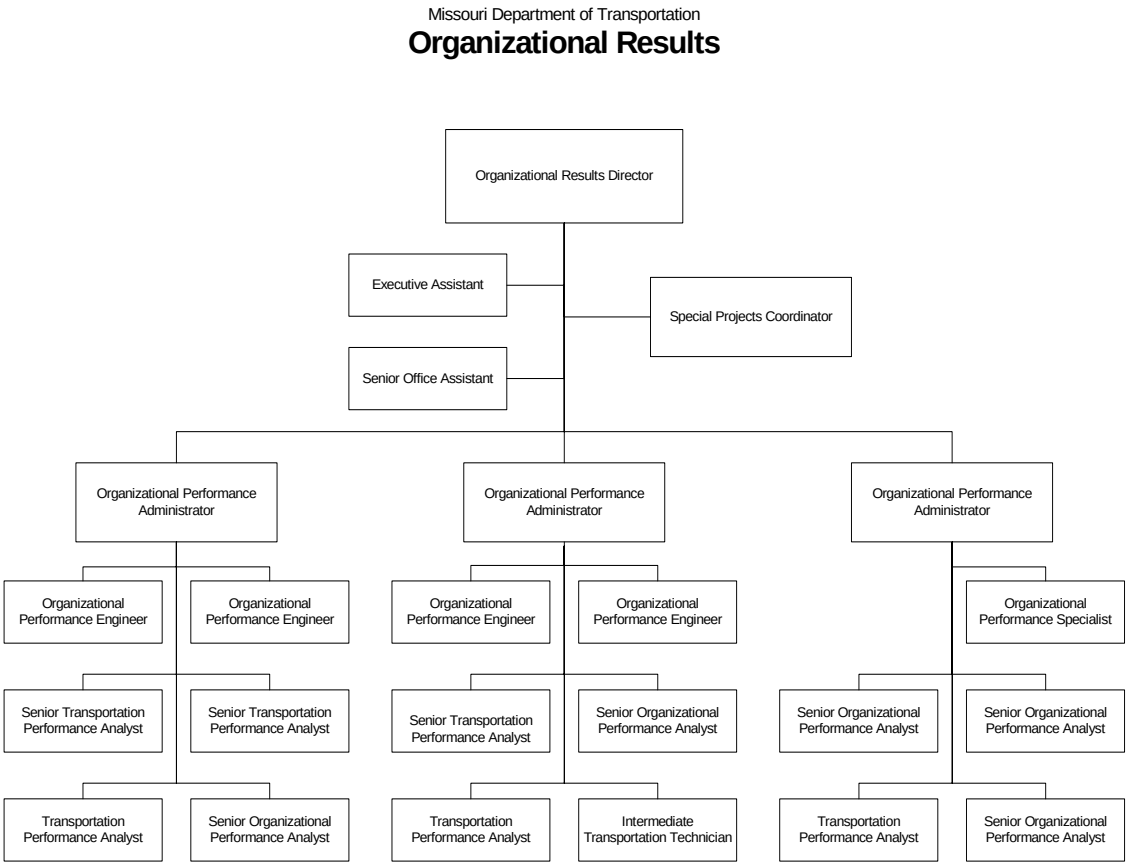


Figure 2, Organizational Results Staff Organization

Products and Services

Organizational Results works closely with department administration and senior managers to offer products and services in three key areas:

Organizational Support

We seek to provide MoDOT with the tools and expert consultation to drive performance excellence.

- Performance analysis and consultation
- Performance measurement development
- Quality systems and tools development
- Process team facilitation

Research

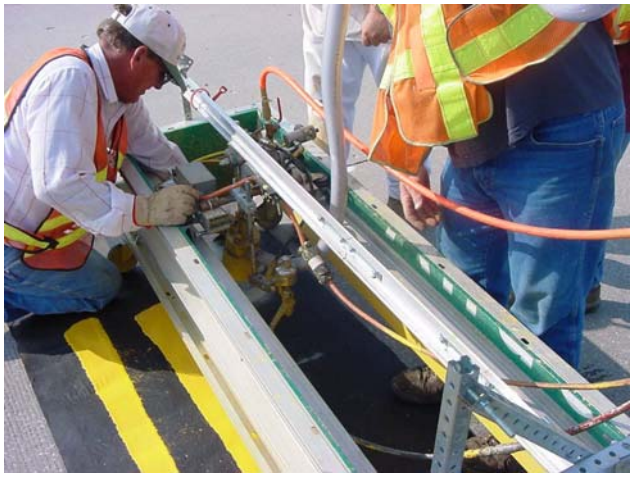
Our business and engineering research program is targeted to have the greatest impact on delivering a world-class transportation experience.

- Administration of research contracts with public and private organizations
- Coordination of multi-state research projects
- Management of in-house research activities

Innovative Solutions

Putting our research to work and taking advantage of best practices are critical to our success.

- Research Implementation
- Research Workshops
- Coordination of Applied Technologies
- New Products Evaluation
- Best Practice Sharing
- Literature Searches



Strategic & Business Plans

Research is an important tool in identifying and closing performance gaps. The challenge for Organizational Results is to focus on research projects that will have the greatest impact on delivering a world-class transportation experience that delights MoDOT's customers and promotes a prosperous Missouri. This approach is dependent upon partnering with public and privates sectors, as well as taking full advantage of best practices and innovation.

Every two years, Organizational Results interviews literally hundreds of MoDOT managers, technologists, practitioners and external research partners to identify potential research topics that can help us deliver MoDOT's 18 tangible results. The culmination of this assessment is a daylong brainstorming session with 40 to 50 internal and external research partners. A prioritized list of research topics from that session is compared with earlier interviews to produce research focus areas. These areas often address multiple tangible results. Finally, current research is checked for alignment with the vision.

The resulting document is the MoDOT Strategic Research Vision *(Appendix A)*, a critical, over-arching guide in defining the program over the next five years. Organizational Results managers use the vision along with department managers and other transportations experts to identify specific research ideas recognized to close performance gaps and having the greatest impact on the organization. Collaborative partnerships with the Missouri Transportation Institute and

others enable us to transform these research ideas into full research projects carried out by the best, most qualified researchers incorporating the most innovative concepts. The make-up of each year's annual research program *(Appendix B)* should reflect ongoing efforts to pursue the right projects in the right areas, making a positive difference to Missouri's transportation program.

However, while the vision is critical in establishing the framework for research programming, it's likely issues and projects will arise, which may not directly fit in one of the focus areas. Nonetheless, Organizational Results will continue to address critical research needs in a timely fashion.

Developing a research program is a dynamic process. Organizational Results will continue to review its vision, as appropriate, to position dollars where they will have the greatest return. The opportunities ahead are endless as collaborations with research partners bring solutions and innovation to the state's transportation system for a better Missouri.

Organizational Results Management Process

The Organizational Results unit is part of MoDOT's Organizational Support Team *(Appendix C)*. This team also includes Audits and Investigations, Governmental Affairs, Community Relations and the Chief Counsel's Office. Unit directors are part of the MoDOT's Executive Team, which meets weekly to discuss high-level organizational performance and strategies. This group also includes the Chief Engineer, the Chief Financial and Administrative Officer, along with the directors of Program Delivery and System Management. This close connection to the highest level of the organization enables Organizational Results to be more responsive and proactive in adjusting its program to align with changing needs and department strategies.

The Organizational Results Management Team meets weekly to discuss pressing business issues, project updates, as well as day-to-day operations. This group includes the Organizational Results Director, the three Organizational Performance Administrators and the Special Projects Coordinator. Management Team meetings are also called as needed to address specific business needs such as staffing, budget and resource allocations.

Bi-monthly project review meetings review status from inception to implementation. Special attention is given to on-time and on-budget project delivery. An active project database, containing budget and scheduling details, is maintained to facilitate this process. Organizational Results uses a general customer survey and a contract research survey with its internal customers to determine the effectiveness of its overall management process.

General Funding

MoDOT receives funds from a variety of sources for Organizational Results activities. Federal-aid and state moneys are the primary sources for funds. Available sources include but are not limited to the following:

- State Planning and Research (SPR) funds *(80 percent federal-aid funds with 20 percent state or partnering match)*
- State transportation budget
- Federal-aid funds from transportation legislation for safety projects
- Direct grants from the FHWA for specific projects
- Other SAFETY-LU-legislated special project funds which may include research
- Local Technical Assistance Program (LTAP) – 50 percent federal *(40 percent SPR and 10 percent state funds)*
- Other federal agency grants from FTA, FAA, Department of Energy and others
- National Science Foundation and NCHRP grants for basic types of research
- Private Sector Funds – cost sharing and consortia participation

MoDOT makes every attempt to use all of the available SPR funds on appropriate research, development and technology and business planning activities. Individual projects are identified and through extensive interaction with MoDOT managers along with our external research partners. Once estimates of project timelines and costs are assembled, Organizational Results brings together champions of proposed projects to explain the research need and rate proposed projects based on their impacts on MoDOT's Tangible Results. Projects with the highest ratings are matched with available research dollars. Management staff is also careful to conduct searches of the TRIS and RIP online research databases to find complimentary research and to avoid duplicative efforts. Only then do projects become a part of Organizational Results' annual work plan. All annual work plan research projects are entered into the RIP online database.

Pooled Funds

Pooled funds projects are the result of several states combining funds for research in areas of mutual interest. FHWA sponsors a national pooled fund program that annually solicits states to submit topics of interest. States are given opportunities to support any programmed projects in which they may have an interest. Regional pooled fund projects result when two or more states commit to mutually support a research project. The NCHRP is a national pooled fund program where member states of AASHTO participate by committing an equal percentage share of their SPR funds to support the program. The program is developed from submittals of the member states that establish priorities through a balloting process.

Internal & External Partnerships

Organizational Results managers maintain regular contact with leadership and technical experts within all areas of the Missouri Department of Transportation. The focus of this work is to identify organizational performance gaps and develop strategies to improve performance. These internal contacts play a vital role in shaping short-term and long-term work plans for

Organizational Results. In addition, Organizational Result's managers regularly visit with university administration and research staff to match department needs with the expertise and capabilities of the university staff and facilities.

Organizational Results' primary external partnership is with the Missouri Transportation Institute (MTI). MTI is a multi-modal and multi-disciplinary consortium of 11 public and private Missouri universities and the Missouri Department of Transportation. MTI is housed at the University of Missouri, Rolla. The primary purpose of MTI is to be the premiere transportation research and technology entity, and the transportation policy/planning "think tank" for Missouri, dedicated to problem solving and advancing the understanding and opportunities for transportation. Organizational Results also partners with MTI to be the focal point for transportation technology transfer and education in the state.

Organizational also partners with two University Transportation Centers (UTC). These federally established centers advance U.S. technology and expertise in transportation disciplines through education, research, and technology transfer at university-based centers of excellence. The Midwest Transportation Consortium is a consortium lead by Iowa State University and the University of Missouri-Columbia. The University of Missouri-Rolla Transportation Center is located at the University of Missouri –Rolla.

Peer Exchanges

Organizational Results hosts a Peer Exchange at least every three years. A Peer Exchange team will consist of at least three representatives from outside MoDOT, such as FHWA, state DOTs, universities or private research and development organizations. At least two of the members will be drawn from a team of pre-approved members as compiled by FHWA.

The purpose of the Peer Exchange is to provide an interactive process to identify and prioritize the activities of Organizational Results and to determine the effectiveness of the research management processes. Peer exchanges verify conformance to effective research development and technology processes and identify areas of needed change.

The Peer Exchange Report is shared within Organizational Results, the MoDOT Executive Team, as well as external individuals or groups who have participated in the review process. The Organizational Results Management Team develops action items based on this review. Copies of the Peer Exchange Report are shared with the Federal Highway Administration, and the state transportation agencies in AASHTO Region III, Kentucky, Tennessee, Arkansas, Oklahoma and others as requested.

Contract Research

Most of MoDOT's research activities are contracted through the Missouri Transportation Institute as outlined in a Master Memorandum of Understanding *(Appendix D)* established in 2004. Additionally, the two organizations have agreed on processes *(Appendix E)* for research pre-proposals, proposals and unsolicited proposals. This approach allows Organizational Results to readily access a specialized expertise and extensive knowledge in a specific area. MTI expands Organizational Result's ability to offer sophisticated approaches to highly innovative technologies.

In-house Research

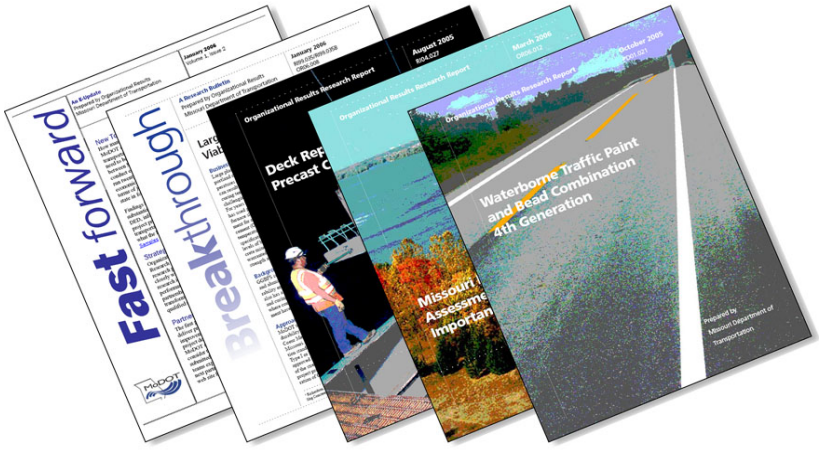
In some instances, research is needed on more practical applied technologies that can best be evaluated by an internal expert. In those cases, Organizational Results coordinates and conducts in-house research activities to investigate and evaluate internal performance issues. While only a fraction of the total research program, in-house research benefits MoDOT by developing and maintaining staff knowledge and expertise on a variety of transportation issues.

Implementation Process

Organizational Result's organizational structure and business processes are distinctly focused on putting research and innovation to work at MoDOT. Post research activities include guidance and consultation on implementation plans, staff workshops and field application assistance. A MoDOT organizational measures tracks the percentage ofinnovative transportation solutions implemented on an annual basis. The benefits of implemented research are documented within an internal project database.

Technology Transfer

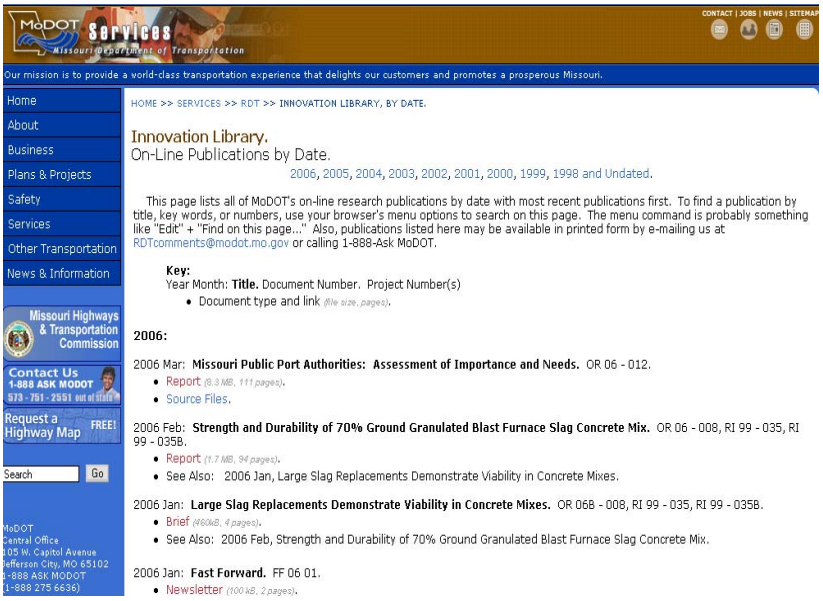
The primary objective of technology transfer is to act as a conduit to transfer findings and information to users. Technology transfer activities are a shared effort by all Organizational Results managers. Numerous methods are used to accomplish this including:



- Training courses
- Libraries (both physical and web-based)
- Report and publication distribution *(See Appendix F for final report requirements.)*
- Research project results input to TRIS database
- Promotion of seminars, conferences, exhibits
- Local Technical Assistance Program (LTAP)
- Technical assistance
- Technology scanning

The Organizational Results physical library is housed within the Missouri State Library in Jefferson City. The state library also provides online access to the library materials. Resources available through the library include:

- Transportation Research Records
- NCHRP Reports
- NCHRP Synthesis
- Transit Cooperative Research Program Reports and Synthesis
- Strategic Highway Research Program Reports
- State Highway Research Program Reports
- Reference Reports received from other transportation agencies, etc.



Organizational Results also provides the Innovation Library through its Internet page. This web-based library includes MoDOT's latest research reports and bulletins along with links to other important web sources for research information. *Fastforward*, a quarterly electronic newsletter, highlights engineering and business innovations for internal and external research partners. Hard copies of reports and bulletins are also made available upon request.

The Local Technical Assistance Program is administered through a cooperative agreement with the Missouri Transportation Institute and the University of Missouri-Rolla. The Missouri Local Transportation Resource Center through information and training tools offers a direct, hands-on method to move innovative transportation technologies out of the lab, off the shelf, and into the hands of the people who maintain our local streets and roads. The center also serves other state DOTs, municipal planning organizations (MPOs), regional planning agencies (RPAs), private consultants and local agencies.

Training

The success of MoDOT is dependent on the continued education and development of its staff. Organizational Results supports this effort by budgeting funds for workshops and other training through the SPR program. Since the costs of this training is a budgeted item in Part II of the Annual SPR Work Program, authorization to sponsor a course or workshop is obtained from Organizational Results prior to committing funds for the training.

Appendices

Appendix A – MoDOT's Strategic Research Vision 2006-2010

Appendix B – Draft Research Program Budget

Appendix C – MoDOT Organizational Chart

Appendix D – Master Memorandum of Understanding

Appendix E – MTI/MoDOT Processes

Appendix F – Final Research Template

Organizational Results

November 2005

Strategic Research Vision

2006-2010

Missouri Department of Transportation

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Overview

On June 1, 2005, the Organizational Results Division was formed to provide support and consultation to MoDOT managers in achieving our 18 tangible results. Research is an important tool in identifying and closing performance gaps. Our challenge is to focus on research projects that will have the greatest impact on delivering a world-class transportation experience that delights our customers and promotes a prosperous Missouri. Our approach is dependent upon partnering with public and privates sectors, as well as taking full advantage of best practices and innovation.

Literally hundreds of interviews have been held with MoDOT managers, technologists, practitioners and our external research partners to identify potential research topics that could help us deliver our 18 tangible results. The culmination of this assessment was a daylong brainstorming session with nearly 40 internal and external research partners. A prioritized list of research topics from that session was compared with earlier interviews to produce ten research focus areas. Each of these areas addresses multiple tangible results. Current research was checked for alignment with the vision.

The MoDOT Strategic Research Vision will serve as a critical, over-arching guide as we further define our program in the coming years. Organizational Results managers will work closely with department managers and other transportations experts to identify specific research ideas, within each of the ten focus areas, recognized to close performance gaps and having the greatest impact on our organization. Collaborative partnerships with the Missouri Transportation Institute and others will enable us to transform these research ideas into full research projects carried out by the best, most qualified researchers and incorporating the most innovative concepts. The make-up of each year's annual research program should reflect our ongoing efforts to pursue the right projects in the right areas, making a positive difference to Missouri's transportation program.

Research Focus Areas

Highway Safety

Highway safety is simply a top priority of MoDOT, and the department works constantly to minimize the number of fatalities and injuries occurring along Missouri roadways. Whether it's safer work zones, better roadway visibility, improved roadside safety, or effective safety management, new and innovative technologies offer potential solutions for increased safety in these critical areas. Pursuing improved driver education and better understanding of the link between driver behavior and safer roadways are also recognized as notable areas, which encourage highway safety. Advancing research in the area of *Highway Safety* will promote a safer transportation system, uninterrupted traffic flow, roadway visibility, innovative transportation solutions, and efficient movement of goods across Missouri's roadways.

Traffic Management

Keeping traffic moving and limiting traffic hazards are keys to the efficient and safe movement of people and goods across Missouri's transportation system. Congestion, work zones, inclement weather, and unforeseen incidents each contribute to traffic delays and unsafe conditions on our roadways. Expanded knowledge and innovative applications in areas such as construction and work zones, traffic modeling, and incident management are recognized as ways to effectively meet those challenges. Advancing smart technologies, such as ITS and others, allows the communication of immediate and accurate advisory information among motorists and government agencies. These exciting capabilities will provide faster response and decisions, reduced travel delays, minimized incidents, and ultimately lives saved. The overall pursuit of research in the area of *Traffic Management* should support a safer transportation system, roadway visibility, innovative transportation solutions, and promote uninterrupted traffic flow and efficient movement of goods in Missouri.

Transportation Management Systems

Managing MoDOT's transportation assets is a huge undertaking. Making wise business and engineering decisions concerning the upkeep and expansion of Missouri's transportation infrastructure is critical to MoDOT's overall economic and operational health. Advanced knowledge and methodologies in support of improved management of our transportation assets, including bridges, pavements, and roadsides should guide MoDOT in making more cost-effective, infrastructure investment decisions. The well being of our physical system will improve through better and timelier system maintenance, rehabilitation, replacement, and construction operations. Innovative approaches and tools designed to collect and maintain reliable infrastructure performance data, including health monitoring, are needed for not only current performance tracking but also for future performance modeling for allowing improved and advanced decision making. Advancing technology through research in the area of *Transportation Management Systems* should help MoDOT achieve smooth and unrestricted roads and bridges, attractive roadsides, innovative transportation solutions and at the same time obtain the best value for every dollar spent. Additionally, this research will support convenient, clean and safe roadside accommodations and environmental responsibility.

Road & Bridge Design

Providing Missourians with roads and bridges designed to handle traffic and last a long time are core functions at MoDOT. However, increasing traffic demands and an aging infrastructure requires MoDOT to seek out the latest design technologies for the most reliable pavements and bridges. Whether it's new construction, rehabilitation, or retrofitting, our designers need more options to ensure long-lasting performance and that can be constructed under tight schedules or restrictive conditions when needed. In addition, options should allow cost-effective applications appropriately tailored to meet realistic long-term needs. A focus on *Road & Bridge Design* research will help MoDOT provide smooth and unrestricted roads and bridge, fast projects of great value, innovative transportation solutions and the best value for every dollar spent.

Advanced Materials for Roads & Bridges

The performance of Missouri's roads and bridges is highly dependent upon the materials used in their construction and maintenance. The type and quality of materials used are directly related to the overall performance, durability, and service-life of our transportation infrastructure. Needs are great for better performing, cost-effective materials used in constructing, maintaining, rehabilitating and retrofitting roads and bridges. Improved materials must allow rapid placement and use, as well as withstand Missouri's seasonal conditions. High performance materials and innovative concepts, introducing such materials as plastics and recyclables, may potentially bring better value and reliability to our system, while also qualifying as environmentally friendly. Advanced materials testing and evaluation techniques may provide methods for quick answers to ensure immediate and long-term performance. Research in support of *Advanced Materials for Roads & Bridges* will help MoDOT deliver smooth and unrestricted roads and bridges, roadway visibility and the best value for every dollar spent. Advanced materials will also support fast projects of great value, innovative transportation solutions, and the department's efforts toward being environmentally responsible.

Transportation Security

Missourians depend upon MoDOT to provide a secure transportation system. With the recent destruction and devastation occurring in the gulf-coast coupled with the recent four-year anniversary of the September 11 terrorists' attacks, the vulnerability of our nation's infrastructure becomes evident. The physical and economic impacts can be tremendous. Missouri must be proactive and prepared for potential natural or man-made events that could threaten the operation and safety of our transportation system. Research efforts are needed to expand our knowledge and readiness in keeping our system secure. Security gaps and weaknesses must be identified, and proper techniques and resources developed to prepare and protect Missouri's transportation infrastructure. A research focus on *Transportation Security* will help MoDOT provide smooth and unrestricted roads and bridges, uninterrupted traffic flow, and a safe transportation system.

Modal Access & Mobility

While state transportation agencies have typically focused on roads, factors such as increased congestion and traffic delay, fuel costs, environmental issues are leading to a greater demand for alternate modes of transportation. MoDOT needs to expand its understanding of passenger and freight access and mobility via the alternate modes including waterways, rail, air, and passenger services. More information is also needed on the social, environmental and economic benefits of supporting multimodal transportation. Research in *Modal Access & Mobility* will help MoDOT provide easily accessible modal choices and efficient movement of goods. In addition, such research will support environmental responsibility and partnering with others to deliver transportation services.

Economic Issues Related To Transportation

Transportation improvements have long been associated with economic development. The relationship is muddied by the changes in this relationship over time. The transportation system has been mostly built-out, business and industry trends have changed, and there are location specific circumstances leading to development. Information is needed regarding the strength of this relationship, the circumstances under which land use, development, and transportation improvements are most closely linked, as well as how we can use transportation as a catalyst in development of the state and national economies. A focus on *Economic Issues Related to Transportation* will help MoDOT leverage transportation to advance economic development, partner with others to deliver transportation services while providing fast projects that are of great value and the best value for every dollar spent.

Customer Communication & Expectations

Transportation, just like any business, needs to know the "pulse" of its customers to ensure services meet customer needs and expectations. Understanding customers involves understanding how to best communicate with them, as well as understanding how we can best hear their voices. It also includes understanding customer perception and expectations of the services we provide, the look and feel of the transportation system, and even how we conduct business. Studies are needed on the most beneficial levels of customer involvement, the range of customer expectations regarding our facilities, services, and business operations, opportunities to target customer segments, appropriate future technologies to employ, and most importantly, the overall effectiveness of our customer communication. Advancing our knowledge in the area of *Customer Communication & Expectations* will help MoDOT improve both inbound and outbound customer communication, as well as customer involvement in transportation decision-making, attractive roadsides, environmental responsibility, and convenient, clean and safe roadside accommodations.

Funding & Finance Issues

The transportation industry is in an era of unprecedented change marked by unending demands for increased services and infrastructure with a budget that severely restricts the industry's ability to adequately respond. MoDOT must find the best ways to create and expand public-private partnerships, foster innovation in finance, and leverage resources to provide not only the best service for the dollar, but also the most service. Efforts should focus on finding more resources for transportation and stretching the resources we do have. Focusing on *Funding & Finance Issues* will help MoDOT deliver fast project that are of great value and the best value for every dollar spent, partner with others to deliver transportation services, be an advocate for transportation issues and leverage transportation to advance economic development.

Tangible Results by Focus Area

Highway Safety

- Uninterrupted Traffic Flow
- Safe Transportation System
- Roadway Visibility
- Innovative Transportation Solutions
- Efficient Movement of Goods

Traffic Management

- Uninterrupted Traffic Flow
- Safe Transportation System
- Roadway Visibility
- Innovative Transportation Solutions
- Efficient Movement of Goods

Transportation Management Systems

- Smooth and Unrestricted Roads and Bridges
- Innovative Transportation Solutions
- Environmentally Responsible
- Convenient, Clean & Safe Roadside Accommodations
- Best Value for Every Dollar Spent
- Attractive Roadsides

Road & Bridge Design

- Smooth and Unrestricted Roads and Bridges
- Innovative Transportation Solutions
- Fast Projects that are of Great Value
- Best Value for Every Dollar Spent

Advanced Materials for Roads & Bridges

- Smooth and Unrestricted Roads and Bridges
- Roadway Visibility
- Innovative Transportation Solutions
- Fast Projects that are of Great Value
- Environmentally Responsible
- Best Value for Every Dollar Spent

Transportation Security

- Uninterrupted Traffic Flow
- Smooth and Unrestricted Roads and Bridges
- Safe Transportation System

Modal Access & Mobility

- Partner with Others to Deliver Transportation Services
- Environmentally Responsible
- Efficient Movement of Goods
- Easily Accessible Modal Choices

Economic Issues Related To Transportation

- Partner with Others to Deliver Transportation Services
- Leverage Transportation to Advance Economic Development
- Fast Projects that are of Great Value
- Best Value for Every Dollar Spent

Customer Communication & Expectations

- Personal, Fast, Courteous and Understandable Response to Customer Requests
- Environmentally Responsible
- Customer Involvement in Transportation Decision-Making
- Convenient, Clean & Safe Roadside Accommodations
- Attractive Roadsides
- Accurate, Timely, Understandable and Proactive Transportation Information

Funding & Finance Issues

- Partner with Others to Deliver Transportation Services
- Leverage Transportation to Advance Economic Development
- Fast Project That Are of Great Value
- Best Value for Every Dollar Spent
- Advocate for Transportation Issues

Current Research by Focus Areas

Highway Safety

Current projects in support of this focus area:
- RI05-037 Automatic Flagger Assistance Device
- RI05-039 Evaluation of Brifen Wire Rope Safety Fence
- RI00-024 Sign Component Test Deck
- PD01-021 Waterborne Traffic Paint and Bead Combination 4th Generation
- PD01-027 Investigation of Centerline Rumble Strip
- PD02-008 3M Linear Delineation Systems
- PD02-031 All Weather Wet Reflective Tape
- PD03-020 Epoplex LS-90 Pavement Marking Material
- PD05-012 Study of Modified Urethane Traffic Striping Paint

Traffic Management

Current projects in support of this focus area:
- RI02-023 Traffic Adaptive Speed Control
- RI05-043 Dynamic Late Merge System

Transportation Management Systems

Current projects in support of this focus area:
- RI01-007 Development and Implementation of Environmental Roadside Inventory
- RI04-001 Sign Shop Process Study
- TPF-5(063) Transportation Asset Management
- TPF-5(111) Development of Standards for Geotechnical Management System

Road & Bridge Design

Current projects in support of this focus area:
- RI77-022 Roadway Design Variable to Reduce D-Cracking
- RI91-013 Field Survey of D-Cracking in Pavements with Differing Aggregates
- RI97-043 Ultra-Thin Whitetopping for Pavement Rehabilitation, D7, Rte 60, Neosho, Newton Co.
- RI99-012 Evaluation of Ultra-Thin Whitetopping, D1, Rte 169 and YY, Buchanan County
- RI99-012B Evaluation of Ultra-Thin Whitetopping, D4, Rte 291 and 78, Jackson County
- RI99-026 Shear Tests of High Performance Steel Hybrid Girders
- RI00-059 Evaluation of Performance Serviceability of HPS Girders
- RI02-002 Steel Free Hybrid Reinforcement System for Concrete Bridges (Phase I)
- RI02-002B Implementation of Steel Free Hybrid Deck (Phase II)
- RI02-022 Preservation of Missouri Transportation Infrastructure: Flexural Upgrade of Deficient Bridges with Composites
- RI03-007 Performance Evaluation of Precast Prestressed Concrete Pavements
- RI04-002 AASHTO M-E Pavement Design Guide Implementation in Missouri

Road & Bridge Design (cont'd.)

- RI04-027 Deck Replacement With Precast Reinforced Concrete Systems
- RI05-024 Performance of Bridge Decks Using Precast, Prestress Deck Panels in Missouri
- TPF-5(048) Accelerated Testing Facility

Advanced Materials for Roads & Bridges

Current projects in support of this focus area:

- RI92-004 Statewide Study of Cathodic Protection Systems
- RI97-037 Effects on Freeze-Thaw Durability of Concrete containing HRWR
- RI98-006 An Evaluation and Determination of the Variability Existing in ASTM C-457 Using the Linear Traverse Method/Development of an Automated System to Analyze Hardened Concrete
- RI98-007D Slope Stabilization Using Recycled Plastic Pins – Phase III
- RI99-035 Strength and Durability Characteristics of a 70% Ground Granulated Blast Furnace Slag Concrete Mix
- RI00-027 Stainless Steel Reinforcing Bars in Bridge Decks
- RI03-004 Evaluation and Implementation of the Air Void Analyzer (AVA) in Missouri
- RI04-051 Bridge Deck Concrete Sealers
- RI05-030 Pavement Base Permeability Testing for US63
- RI05-044 Arc-Spray Galvanic Anode for Bridge Substructure
- TPF-5(066) Material and Construction Optimization for Prevention of Premature Pavement Distress in PCCP
- TPF-5(092) Test and Evaluation of Materials, Equipment, and Methods for Winter Maintenance
- TPF-5(021) North Central Superpave Center
- National Center for Asphalt Technology (NCAT) Part II

Transportation Security

Current projects in support of this focus area:

- RI02-010 Post Earthquake Damage Evaluation of Bridge Structures
- RI02-011 Seismic Retrofit Techniques for Beam Caps
- RI03-029 Comprehensive Shear-Wave Velocity Study
- RI04-007 Assessment and Analysis of Natural Hazards to Missouri Radio Tower Network

Modal Access & Mobility

Current projects in support of this focus area:

- RI03-056 Airport Project Economic Benefit Study
- RI05-041 Inter City Bus Demand Study
- RI05-042 Assessment and Evaluation of Missouri Port and Waterways Needs

Economic Issues Related To Transportation

Current projects in support of this focus area:

- REMI analyses of selected projects and programs
- RI05-045 Using GIS Based Business locations to Understand Business Development and Movement near Transportation Projects
- RI05-046 Increased Interagency Partnering and Local Planning to Increase Development Potential

Customer Communication & Expectations

Current projects in support of this focus area:

- RI05-002 Tracker Customer Involvement and Performance Surveys
- RI05-035 MoDOT Customer Satisfaction Tracking for FY06
- Community Relations Advance
- RI05-047 Evaluation of D4 Customer Satisfaction Survey Data
- RI05-034 Customer Satisfaction Survey of Missouri Drivers

Funding & Finance Issues

Current projects in support of this focus area:

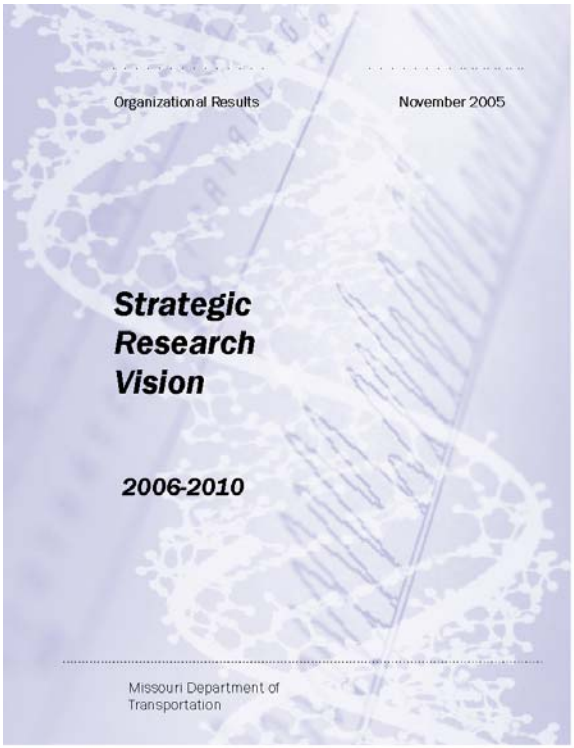
- Innovative Finance Development Team (In conjunction with various MoDOT work units, local development interests, and Missouri Department of Economic Development)

Next Steps

As the framework for the development of MoDOT's annual research program, the Strategic Research Vision will play a vital role as research ideas are identified and developed into research projects. These projects will address a pertinent need and support MoDOT's delivery of a world-class transportation experience that delights our customers and promotes a prosperous Missouri.

As we further mature our research program, every effort will be made to ensure ideas initiated and projects pursued align with the Strategic Research Vision. However, while the vision is critical in establishing the framework for our research programming, it's likely issues and projects will arise, which may not directly fit in one of the ten focus areas. Nonetheless, we will continue to address critical research needs in a timely fashion.

Developing our research program is a dynamic process. We will continue to review our vision, as appropriate, to position our dollars where they will have the greatest return. The opportunities ahead are endless as we collaborate with our research partners in bringing solutions and innovation to our transportation system for a better Missouri.



As part of a collaborative partnership, the Missouri Transportation Institute evaluates research ideas. If you think you have a research idea in one of our focus areas, please contact MTI at (573) 341-7639 or visit them on the Web at http://campus.umr.edu/mti/feedback.htm.

Projected Research Budget Programming FY 2006-FY 2009

RI Number	Job Title	FY06 Budget	FY07 Budget	FY08 Budget	FY09 Budget	Champion
	Highway Safety					
RI05-056	Before and After Surveys of Various 2006 Highway Safety Media Campaigns ($40)	$ 20,000	$ 20,000			Depue
(proposed)	Increase Safety Belt Usage (w/o Primary Law)		$ 50,000			Depue
(proposed)	Increase Safety Belt Usage in Younger Drivers		$ 25,000	$ 25,000	$ 25,000	Depue
(proposed)	Younger Driver Education		$ 25,000	$ 25,000	$ 25,000	Depue
(proposed)	Reducing Alcohol-Related Crashes		$ 30,000	$ 30,000	$ 30,000	Depue
(proposed)	Impacts of Public Policy Changes (zero tolerance, GDL, helmet laws…)		$ 15,000	$ 15,000		Depue
(proposed)	Impacts of Safe Routes to School Enhancements		$ 15,000			Depue
(proposed)	Benefit/Cost Evaluation of Rumble Stripes		$ 20,000			Rackers
(proposed)	Understanding Relationship Between CMV and Fatal Accidents		$ 20,000			Skouby
	TOTAL	$ 20,000	$ 220,000	$ 95,000	$ 80,000	
RI Number	**Job Title**	**FY06 Budget**	**FY07 Budget**	**FY08 Budget**	**FY09 Budget**	**Champion**
	Traffic Management					
RI02-023	Traffic Adaptive Speed Control	$ 30,000	$ -	$ -	$ -	Rackers
RI06-007	Evaluation of Experimental Traffic Signal Phase Enforced	$ 10,000	$ 10,000			Rackers
RI06-008	Independent Evaluation of Traffice Information from Cellular Floating Vehicle Data	$ 25,000	$ 15,000			Rackers
(proposed)	Best Practices for ITS Equipment Procurement		$ 15,000			Rackers
(proposed)	Flashing Yellow Arrow Left-turn phasing		$ 10,000			Rackers
(proposed)	Dynamic Merge on I-44	$ 5,000	$ 20,000			Rackers
(proposed)	Providing the Best Traffice information through Private Communication Channels		$ 15,000			Skouby
(proposed)	Study of Other States Truck Parking of Roads	$ 5,000				Skouby
	TOTAL	$ 53,900	$ 85,000	$ -	$ -	
RI Number	**Job Title**	**FY06 Budget**	**FY07 Budget**	**FY08 Budget**	**FY09 Budget**	**Champion**
	Transportation Management Systems					
TPF-5(111)	Development of Standards for Geotechnical Management System	$ 10,000	$ 10,000	$ 10,000	$ -	Fritz/Ahlvers
(proposed)	Facilities-Efficient Disposal of Maintenance Materials			$ 20,000		Dewitt
	TOTAL	$ 10,000	$ 10,000	$ 30,000	$ -	

Red = Proposed
Green = Funds by others

Projected Research Budget Programming FY 2006-FY 2009

RI Number	Job Title	FY06 Budget	FY07 Budget	FY08 Budget	FY09 Budget	Champion
	Road & Bridge Design					
RI05-052	Indirect Creep Compliance and Tensile Strength of Missouri HMA Wearing Courses	$ 30,000	$ [illegible]			Ahlvers
RI06-001	Resilient Moduli of Typical MO Soils and Unbound Granular Base Materials	$ 30,000	[illegible]			Ahlvers
RI06-001	Resilient Moduli of Typical MO Soils and Unbound Granular Base Materials		[illegible]0			Ahlvers
RI99-026	Shear Tests of High Performance Steel Hybrid Girders	$ 2,400	$ -	$ -	$ -	Gupta
RI00-059	Evaluation of Performance Serviceability HPS Girders	$ [illegible]00		$ -	$ -	Gupta
RI02-002	Steel Free Hybrid Reinforcement System for Concrete Bridges	$ [illegible]0	$ -	$ -	$ -	Gupta
RI02-002B	Implementation of Steel Free Bridge Deck		[illegible]0			Gupta
RI02-022	Preservation of Missouri Transportation Infrastructure: Flexural Upgrade of Deficient Bridges with [illegible]site	$ [illegible]0	$ 125,000	$ 125,000	$ -	Keith
RI03-007	Performance Evaluation of Precast Pre[illegible]nc[illegible] Pavements		$ 62,000	$ -	$ -	Donahue/Ahlvers
RI04-002	AASHTO M-E Pavement Design Guid[illegible]tio[illegible] MO	$ [illegible]00	$ -	$ -	$ -	Nichols
TPF-5(048)	Accelerated Testing Facility	$ 79,929	$ 79,929	$ 79,929	$ -	Ahlvers
RI05-036	Structual Assessment of the I-70 Blan[illegible]e Br[illegible]	$ 20,000	$ 50,000			Callahan/Carney
RI05-036	Evaluation of Thin AC Overlays on US [illegible] Cla[illegible]oun[illegible]n-house)	$ 150,000	$ 100,000			Keith
(proposed)	Diverging Diamond Interchange Perfo[illegible]nc[illegible]		$ 25,000	$ 25,000		Wright
RI06-003	IRI vs.PI as a Measurement of Pavem[illegible]nness	$ 5,000				Hitt/Ahlvers
RI06-009	Lane Divided highways	$ 4,000				Harvey
(proposed)	Geotechnical Advancement		$ 75,000	$ 50,000		Fritz/Ahlvers
	TOTAL	$ 658,329	$ 664,729	$ 229,929	$ -	

Red = Proposed
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Projected Research Budget Programming FY 2006-FY 2009

RI Number	Job Title	FY06 Budget	FY07 Budget	FY08 Budget	FY09 Budget	Champion
	Advanced Materials for Roads & Bridges					
RI98-006	An Evaluation and Determination of the Variability Existing in ASTM C-457 Using the Linear Traverse Method	$ 6,000	$ -	$ -	$ -	Ahlvers/Hitt
RI98-007D	Slope Stabilization Using Recycled Plastic Pins-Phase III	$ 101,200	$	$ -	$ -	Fritz/Ahlvers
TPF-5(066)	Material and Construction Optimization for Prevention of Premature Pavement Distress in PCCP	$ 15,000	$	$ -	$ -	Ahlvers
TPF-5(092)	Test and Evaluation of Materials, Equip, and Methods for Winter Maintenance	$ 25,000		$ -	$ -	Carney
TPF-5(021)	North Central Superpave Center	$ 25,000		$ 25,000	$ -	Ahlvers
	NCAT part II	$ -		$ 235,000	$ 230,000	Ahlvers
RI06-002	Placement and Evaluation of Preventive Maintenance Test Sections	$ 250,000				Keith
(proposed)	NDT Technologies for Bridge Maintenance Applications			$ 75,000		Callahan/Carney
	TOTAL	$		$ 260,000	$ 230,000	
RI Number	**Job Title**	**FY06 Budget**	**FY07 Budget**	**FY08 Budget**	**FY09 Budget**	**Champion**
	Transportation Security					
RI02-010	Post Earthquake Damage Evaluation	$	$ -	$ -	$ -	Gupta
RI02-011	Seismic Retrofit Techniques for Cap B	$	$ -	$ -	$ -	Gupta
RI03-029	Comprehensive Shear-wave Velocity	$ 5,400	$ -	$ -	$ -	Fritz/Ahlvers
RI04-007	Assessment and Analysis of Natural H ds to Radio Tower Network	$ 12,700	$ -	$ -	$ -	Bennett/Rackers
RI05-007B	Metallic Dampers Workshop	$ 4,000				Gupta
RI05-023	Assessment of Bill Emerson Memorial ge Based on Seismic Instrumentation Data	$ 25,000	$ 25,000			Gupta
(proposed)	Impact of New Seismic Design Provisi pooled fund)	$ 30,000				Gupta
(proposed)	Midwest Pooled-Fund Seismic Effort		$ 50,000	$ 50,000		Gupta
	TSA Pilot Project with Highway Patrol pliance Reviews)			$ 20,000		Skouby
(proposed)	Sonar for Underwater Bridge Inspection-pooled fund study		10,000			Callahan/Carney
	TOTAL	$ 89,900	$ 75,000	$ 70,000	$ -	

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Projected Research Budget Programming FY 2006-FY 2009

RI Number	Job Title	FY06 Budget	FY07 Budget	FY08 Budget	FY09 Budget	Champion
	Modal Access and Mobility					
RI03-056	Airport Project Economic Benefit Study	$ 100,000	$ 52,000	$ -	$ -	Weiler
(proposed)	AASHTO Freight Transportation Bottom Line Report (pooled fund)	$ 15,000				Watkins
(proposed)	Missouri Inland Freight Distribution		$ 35,000			Watkins
	What Does CMV Industry Need to Improve Efficiency			$ 30,000		Skouby
RI05-051	Container on Barge Literature Review for Direction	$ 6,000				Weiler
RI05-053	Maximize Freight and Passenger Rail -UP line	$ 40,000	65,000			Weiler
(proposed)	Amtrak Customer Survey and Market Research		$ 125,000			Weiler
(proposed)	Analysis/Opportunities to increase Car Share/Ride Share			$ 45,000		Weiler
	TOTAL	161,000	$ 277,000	$ 75,000	$ -	

RI Number	Job Title	FY06 Budget	FY07 Budget	FY08 Budget	FY09 Budget	Champion
	Economic Issues Related to Transportation					
RI02-058	REMI analyses of selected projects and programs	$ 40,000	$ -	$ -	$ -	Rahn/Keith
RI05-045	Using GIS Based Business Locations to Understand Business Development and Movement after Transportation Projects	$ 25,000	$ -	$ -	$ -	Broeker
RI06-005	I-64 Business Census Special Analysis	$ 25,000				Keith/Campbell
RI06-006	Community, Transportation Access and Development		$ 35,000			Broeker
006-XXX	Continued Work with DED to develop understanding and approach to ED			$ 70,000		Broeker/Keith
007-XXX	Understanding Passenger and Freight Modal Optimization from and Economic Efficiency Perspective		$ 60,000	$ 60,000		Broeker/Keith
RI05-048	Better understanding the value of the NCHRP 20-63 PM Tool	$ 10,000				Campbell
RI06-XXX	Innovation and Implementation Tracking and Management		$ 20,000			Campbell
	TOTAL	$ 100,000	$ 95,000	$ 130,000		

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Projected Research Budget Programming FY 2006-FY 2009

RI Number	Job Title	FY06 Budget	FY07 Budget	FY08 Budget	FY09 Budget	Champion
	Customer Communication and Expectations					
RI05-002	MTI work plan for MoDOT Customer Satisfaction Tracking	$ 121,384	$ -	$ -	$ -	Rahn/Campbell
RI05-035	MoDOT Customer Satisfaction Tracking	$ 286,856	$ 143,428	$ 143,428	$ 143,428	Rahn/Campbell
RI05-035	MoDOT Customer Satisfaction Tracking		$ 143,428	$ 143,428	$ 143,428	Rahn/Campbell
RI05-047	Evaluation of D4 Customer Satisfaction Survey Data	COMPLETE	$ -	$ -	$ -	Wright
RI05-034	Customer Satisfaction Survey of Missouri Drivers	$ 11,431	COMPLETE	$ -	$ -	Rahn
	Best Practices for County Personal Property Tax Receipts		$ 10,000			Skouby
RI06-XXX	Identification of Relevant Customer Segmentation in Understanding and Closing Performance Gaps		$ 125,000			Peck
007-XXX	Adoption of New Technologies for Customer Connectedness			$ 60,000		Peck/Rahn
	TOTAL	$ 419,671	$ 421,856	$ 346,856	$ 286,856	

RI Number	Job Title	FY06 Budget	FY07 Budget	FY08 Budget	FY09 Budget	Champion
	Funding and Finance Issues					
(proposed)	Commercial vs. Personal Diesel Usage		$ 5,000			Dewitt
(proposed)	Simplify Procurement Rules-Best Practices		$ 10,000			Dewitt
RI06-GS	Development of Alternative Fuel Service and Distribution for MoDOT on a Statewide Basis		$ 10,000			Dewitt
RI06-RM	Identification of Opportunities for Innovative Finance Methods in Transportation		$ 25,000			Broeker
(proposed)	Assistance with identification and Development of New Funding Mechanisms for Transportation		$ 50,000			Broeker
007-RM	Expand Funding and Increase Efficiencies			$ 100,000		Broeker/Rahn
98-026C	Library Systems Development	$ 20,000	$ 75,000	$ 75,000	$ 75,000	Campbell
	TOTAL	$ -	$ 175,000	$ 100,000	$ -	

Red = Proposed
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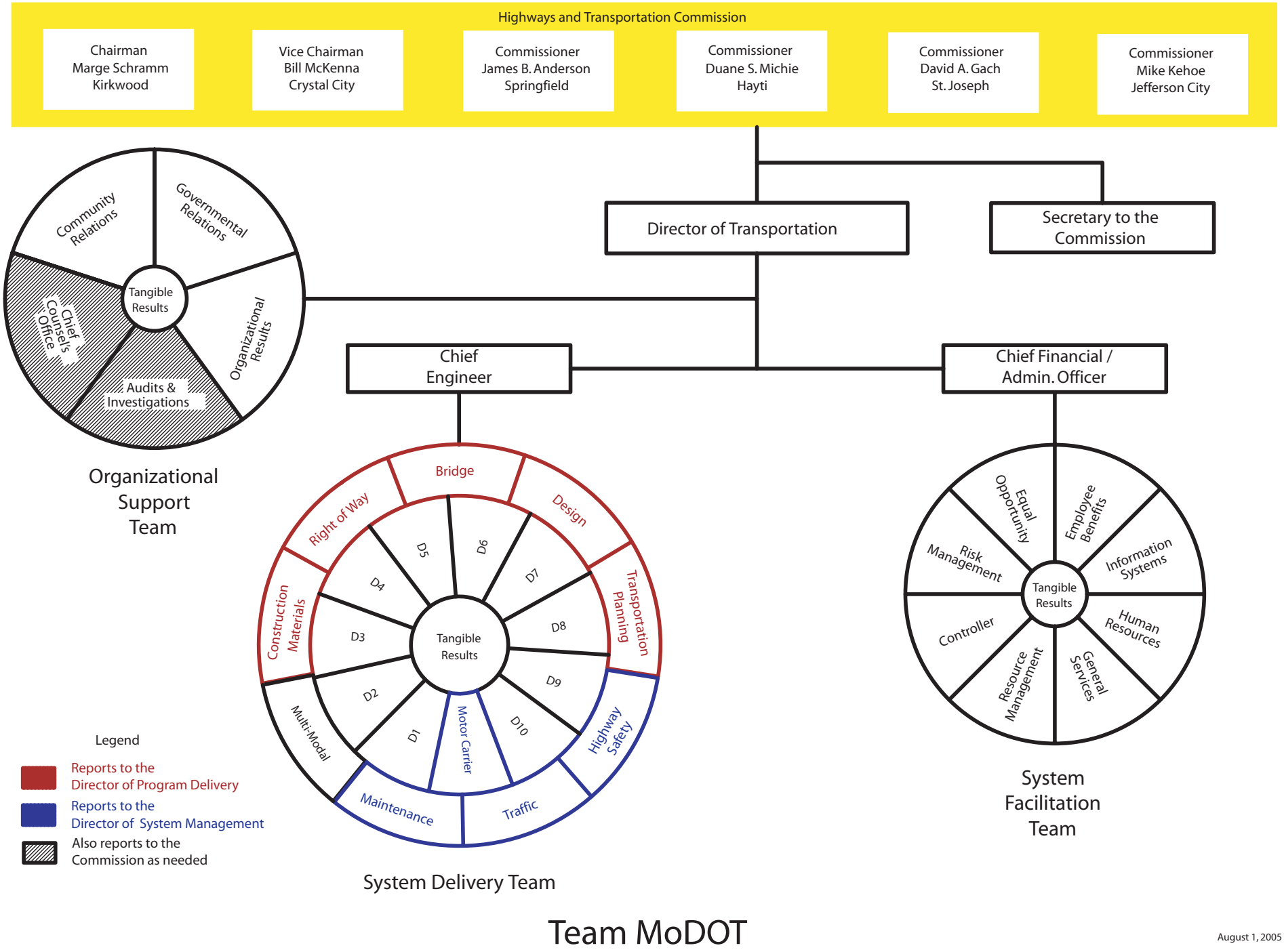
Missouri Department of Transportation



Team MoDOT

August 1, 2005

CCO Form:
Approved: 9/04 (BDG)
Revised:
Modified:

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
CURATORS OF THE UNIVERSITY OF MISSOURI
MASTER MEMORANDUM OF UNDERSTANDING

THIS MASTER MEMORANDUM OF UNDERSTANDING (hereinafter, "MMU") is entered into by and between the Curators of the University of Missouri (hereinafter, "University") and the Missouri Highways and Transportation Commission (hereinafter, "Commission").

WITNESSETH:

NOW THEREFORE, in consideration of the mutual promises, covenants, and representations contained in this Agreement, the parties agree as follows:

(1) BASIC UNDERSTANDING AND OBJECTIVES:

(A) The Commission and the University have a mutual desire to develop and execute education and research projects through the Missouri Transportation Institute (hereinafter, "MTI"), which is an organization of the University administratively located at the University of Missouri-Rolla (hereinafter, "UMR"), under this MMU. The Missouri Department of Transportation (hereinafter referred to as the "Department") is also an integral part of the operations of MTI. Further, the Department will act for the Commission in the setting of the individual projects and in the overall and day-to-day evaluation of these projects and MTI activities as they pertain to Department research, development, and technology transfer needs.

(B) UMR will manage MTI and will enter into sub-awards for particularized research and project support in connection with specific project agreements, as necessary and appropriate in the manner set forth herein, with participants among various public and private university and research organizations (hereinafter referred to as "Participants"). UMR will manage MTI and this process in a fair and unbiased fashion so as to involve the best faculty, student, and professional staff teams available within the network of Participants, or beyond when necessary, to address the transportation research, development and technology transfer needs of the State.

(C) The Commission will transition to MTI selected existing transportation research, development, public policy and technology transfer projects currently being done by the University under the 2002 Basic Agreement between the Commission and the University. All existing projects transitioned will be administered by MTI according to the terms of the 2002 Basic Agreement. During the duration of this

MMU, future transportation research, development, public policy and technology transfer projects supported by the Commission will be conducted through MTI. It is the intention of both parties to this MMU that such projects shall be for the parties' mutual benefit.

(D) The purpose of the projects shall be to deliver prompt, efficient and aggressive attention to the research, development and technology transfer needs of the Commission's transportation system. This MMU is also intended to establish a nationally recognized transportation research center in Missouri to develop and execute intermodal transportation related education, public policy and research projects.

(E) The nature of transportation research and development activities requires rapid responses to defined needs of the system. MTI's success will be evaluated in part on its ability to respond quickly to emergent as well as to longer term research and development needs.

(F) Projects will be planned jointly by representatives of the Commission and the University. Both parties entering this agreement anticipate a continuing effort. Projects will be identified individually as *project agreements* under this MMU, and all conditions established in the MMU shall apply to each project agreement. The project agreements shall specify that they include and incorporate by reference the terms of this MMU, may contain additional terms as necessary and agreed upon by the Commission, the University, and all Participants thereto, and shall generally be in a format similar to Appendix A. Funding for specific project agreements or other mutually agreed upon financial terms for these project agreements shall be based on mutually approved individual work plans and accompanying budgets. Project agreements and budgets will be reviewed on an annual basis (or shorter time period if the project is of shorter duration), and may be renewed annually upon the performance of the project investigator and the mutual approval of work plans and accompanying annual budgets. Individual projects may be recommended for periods greater than one year, but must be renewed annually as described above. Each project agreement will contain project "Special Conditions" and project details, such as Participants, project investigators, purpose, scope of work, schedule, budget, the implementation ability and characteristics of the project, and other items. To the extent of any inconsistency between the project "Special Conditions" and the MMU, the project "Special Conditions" shall control.

(G) UMR will administer MTI in accordance with 49 Code of Federal Regulations (CFR) (Part 19) and with the Office of Management and Budget (OMB) Circular A-21, Principles for Determining Costs Applicable to Grants, Contracts and Other Agreements for Educational Institutions.

(2) <u>OBLIGATIONS OF THE UNIVERSITY</u>:

(A) The University will design in cooperation with the Commission and execute the specific and mutually agreed upon individual projects as approved in project agreements to this MMU.

(B) The University shall manage in cooperation with the Commission a process to assure a merit-based and competitive process for the selection of project team members.

(C) The University will assemble and assign in cooperation with the Commission the highest qualified team as necessary to perform the tasks for each project. Elements in the selection of team members will include the team member's ability to deliver rapid results when appropriate to emergent needs of the Commission and to participate in their implementation, and their willingness to agree to the required flow through terms and conditions of this MMU. The personnel for each team will be assembled from among the Participants, and may also include persons or entities not previously included as Participants, all as mutually agreed to in individual project agreements. The University, directly or through sub-awards, agrees to procure equipment, supplies, and sites as needed, except as provided by the Commission as specified in Paragraphs (3) and (4). Unless specified to the contrary in a particular project agreement, project members, including Participants, shall have the legal status of sub-awardees of the University for purposes of carrying out their project assignments.

(D) The University shall consult the Commission whenever a change in protocol becomes necessary and to furnish an approved revised work plan for the affected individual project agreement.

(E) The University shall keep up-to-date records of experimental results including databases and graphics where appropriate, and to provide these records to the Commission upon request.

(F) Unless specified differently in an individual project agreement, the University shall furnish to the Commission a periodic letter of progress (based upon the individual project agreement schedule; see "Special Conditions" in Appendix A), and to furnish an annual report in a mutually agreed upon electronic format by the first of July each year for all active project agreements. The annual report shall be prepared at an executive summary level and should include budget summary and data, interpretations, evaluations, and conclusions drawn from the data. The annual report submitted for the individual project agreement may be sufficient for the annual review for approval and renewal of that project agreement as specified in paragraph (1)(F).

(G) UMR shall have overall responsibility for the fulfillment of the research, development and/or technology transfer projects contained in the project agreements. In executing a specific project agreement, the Principal Investigator identified in each project agreement shall agree to oversee and ensure completion of the work contained in the project agreement that is assigned to that Principal Investigator and project team. Hence, all project agreements requiring research or other services by a Principal Investigator and project team must be reviewed and agreed to by the Principal Investigator's and project team member's respective organization's official responsible for obligating that type of work performance. Failure

of the Principal Investigator and project team to perform project work in a timely manner may result in the re-assignment of the work to another entity provided such reassignment and the financial ramifications of such reassignment are agreed to by University and the Commission.

(H) The University shall maintain all books, documents, papers, accounting records and other evidence pertaining to the costs incurred for any project agreement under this MMU. This material will be made available for inspection by the Commission, Federal Highway Administration (FHWA), or any authorized representatives thereof at all reasonable times at the office of the University during the period of the MMU and for 3 years after the day of the final payment to University with respect to any project agreement. The University shall furnish copies of such records if requested by the Commission.

(I) The University shall establish, manage and host an automated, project tracking and management system and allow direct automated access to the system by both MTI and the Commission. This system will be established and managed by MTI to monitor performance on projects sponsored by the Commission at MTI.

(J) The University shall provide a comprehensive annual report, which includes but is not limited to current Commission funded research, development, public policy and technology transfer activities. The annual report should summarize active or recently completed project agreements including objectives, scope, status, findings, and implementation of findings. An annual financial summary of activities should be provided in the report.

(3) <u>OBLIGATIONS OF THE COMMISSION</u>:

(A) The Commission shall pay the cost of individual projects under this MMU, including but not limited to, salaries and wages (including benefits), tuition, site preparation, computer services, publication costs, equipment, supplies, and financial and other associated costs, as determined reasonable and appropriate and as mutually agreed to according to the approved budgets of each project agreement.

(B) The Commission shall reimburse Facilities and Administrative ("F&A") costs at a rate of 29% under individual project agreements for the life of this MMU. This rate will apply to all sub-awards under this MMU. F&A costs include, but are not limited to, those incurred for a common or joint purpose benefiting more than one cost objective and not readily assignable to the cost objectives of the individual project agreement. This reduced F&A recovery rate is deemed reasonable because of the provision of funds from the Commission to directly fund 50% of the administrative operational costs of MTI to administer this MMU, including the salaries, travel and other operating expenses of the Director and staff as needed. Payments to the University by the Commission to cover such costs will be made on a quarterly basis. In the event that funds for Commission's share of administrative costs become available to MTI from

sources other than Commission, then these funds can be reprogrammed to support specific projects or other MTI programs mutually agreed upon. The Commission will use the 29% F&A recovery rate for all transportation research, development, public policy and technology transfer projects awarded to institutions of higher learning.

(C) The Commission shall assist University personnel in data collection or other tasks where there is mutual agreement between the parties as specified in individual project agreements.

(D) The Commission shall furnish the University with information in the possession of the Commission that has a bearing upon the project agreed to in individual project agreements.

(4) ALLOWABLE COSTS: The following shall constitute allowable costs:

(A) Salaries and Fringe Benefits: Salaries and fringe benefits charged under individual project agreements will be the current Participant salary and fringe benefit cost in effect during the term of the each project agreement.

(B) Travel: Trips costing in excess of $500 made for the purposes of completing work identified in an individual project agreement and not specifically identified, by purpose or event, and location, in the approved project agreement, must have prior written approval of the Commission to be eligible for reimbursement. Current Participant travel regulations and mileage rates shall apply to all travel for which reimbursement is claimed during the term of the project agreement. Travel costs and mileage rates will be limited to those allowable under federal cost accounting standards.

(C) Consumable supplies, services and other costs will be made in accordance with the Participant's rules and regulations governing sourcing and allowability and will be identified by category in each project agreement's preliminary budget.

(D) Equipment purchases shall be made only in accordance with the terms set forth in paragraph (8).

(E) F&A rates shall be applied as specified in paragraph 3(B). F&A rates may be applied to matching fund requirements for federally funded projects.

(F) In accordance with USC Title 49, Subtitle III, Chapter 55, Subchapter I, Section 5505.f, funds originating from sections 503, 504(b), or 505 of Title 23 USC and administered by the University under awards connected with this MMU or elsewhere, may be used as cost sharing for programs described under USC 49 sect. 5505 described above.

(5) FINANCIAL CONSIDERATIONS:

(A) Each project agreement is to specify a maximum not to exceed amount or other mutually agreed upon financial terms to be paid to the University by the Commission for the specific project as mutually agreed.

(B) Unless stated otherwise in the individual project agreement, invoices and payments on project agreements are to be made on a quarterly basis, with the first invoice submitted within 30 days of the first quarter completed with payment due within 30 days upon receipt. Prior to payment by the Commission, invoices will be reviewed for acceptance and approval. Invoices must be submitted in detail and in the same format as the approved project cost estimate or budget.

(C) The Commission will process for payment to University, all invoices upon receipt.

(D) In no event will the total payments exceed the amount of the project agreement price without prior written approval and authorization by the Commission.

(E) The University shall submit a final voucher, based on actual costs, for the project agreement within 90 days of completion of the individual project agreement. The final payment will be made only after acceptance of a final report and/or other deliverables as specified and agreed to in the individual project agreement.

(F) Payments to the University are to be made to ”The Curators of the University of Missouri” and sent to:

University of Missouri—Rolla
P.O. Box 806010
Kansas City, MO 64180-6010

(G) Any costs incurred by the University prior to notification to proceed from the Commission are not eligible for reimbursement.

(H) The Commission will perform a final audit of project costs. For purpose of an audit, the University shall maintain all those records relating to this MMU, including but not limited to invoices, payrolls, bills, receipts, etc. These records must be available at all reasonable times to the Commission and the FHWA or their designees and representatives, at the University’s offices, at no charge, during the contract period and any extension thereof, and for the three (3) year period following the date of final payment made under this agreement. The Commission will reimburse MTI any monies due and MTI shall refund any overpayments as determined by the final audit.

(6) SUB-AWARDS: Direction of work outlined in individual project agreements should be assigned to a project Principal Investigator who will be held accountable for the work under that project agreement. The University or Participant

shall not assign, sublet, or transfer any of the work other than as specified and agreed to in the project agreement. Compliance shall be maintained with all applicable Federal and State laws and regulations that pertain to the work being performed and including affirmative action when retaining a subcontractor.

(7) RIGHTS AND TITLE TO DATA AND PATENTS:

(A) Publication Rights: The results of the project described in each individual project agreement may be published jointly by the University and the Commission, or separately by either of them, if the other party is given the opportunity to review in advance and provide comments. Manuscripts prepared for publication by either party shall be submitted to the other party for suggestions prior to publication. Prior to submittal, manuscripts shall be in complete form and shall be reviewed and corrected for general clarity and accuracy. Any comments shall be in writing and shall be presented to the entity wishing to publish within 30 days of receipt of the manuscript. It is agreed that proper acknowledgment of funding support will be noted in all publications. In the event of disagreement, either party may publish results on its own responsibility, giving proper acknowledgment of cooperation and disclaiming that the other entity agrees with the contents of the publication. In the event that copyright protection is granted to either party individually in connection with a particular project, the other party shall be granted a paid up, irrevocable, nonexclusive, non-assignable license to use the data solely for its non-commercial purposes. In order to protect Commission's interests, this clause (7)(A) will flow through on any sub-awards under this MMU.

(B) Disclosure: No parties shall publish or otherwise disclose, or permit to be disclosed or published, the interim results of the investigation herein contemplated, or any particulars thereof, during the period of the project agreement, without notifying the other and securing its written comments as described under (7)(A), unless disclosure is required by law. Such written comments regarding any agreed upon factual errors or omissions and/or any other reasonable changes shall be incorporated into any such interim results.

(C) Use of Data: After acceptance of the final report, the Participant, Commission, Department, and FHWA are free to use solely for non-commercial purposes, the data and results of any project agreement supported entirely or partially with federal funds.

(D) Ownership of Data: The data collected under a Project Agreement, together with summaries and charts derived therefrom, shall be owned jointly by the Commission and the Participant with full and complete accessibility to both parties to this MMU unless otherwise agreed to in writing.

(E) Mandatory Clause: All reports, papers, drafts, or abstracts published by the MTI shall contain the following statement: "The opinions, findings and conclusions expressed in this publication are not necessarily those of the Department of

Transportation, Federal Highway Administration. This report does not constitute a standard, specification or regulation."

(F) Ownership of Patents: Inventions conceived or first reduced to practice under this MMU solely by employees of the Commission shall be owned by the Commission ("Commission Inventions"). Inventions conceived or first reduced to practice under this MMU solely by employees of the University shall be owned by the University ("University Inventions"). Inventions conceived or first reduced to practice under this MMU solely by employees of one of the participating organizations shall be owned by that organization ("Participant Inventions"). Inventions conceived or first reduced to practice jointly by employees of the Commission, the University or one of the other Participants ("Joint Inventions") in a particular project shall be owned jointly by the Commission, the University and/or the other Participant(s) as the case may be.

(G) Prosecution and Maintenance of Patents. The Commission shall bear all costs associated with filing patent applications, prosecuting, and maintaining Commission Inventions; the University shall bear all costs associated with filing patent applications, prosecuting, and maintaining University Inventions; and the applicable Participant shall bear all costs associated with filing patent applications, prosecuting, and maintaining its solely owned Participant Inventions. All entities with an ownership interest in a Joint Invention shall share equally in all costs associated with filing patent applications, prosecuting, and maintaining such Joint Inventions. Using patent counsel reasonably acceptable to all co-owners, the University shall take the lead in filing patent applications, prosecuting, maintaining, and licensing Joint Inventions in which it has an ownership interest. The University shall consult in advance with all co-owners as to all significant decisions, and shall keep such co-owners reasonably apprised of the status of all patenting and licensing activities pertaining to the Joint Invention.

(H) Paid Up, Non-Commercial License Rights. The Commission and to the extent that the United States government provides funding for an individual project agreement, in whole or in part, all state highway and/or transportation departments and the United States government shall be granted a paid up, irrevocable, nonexclusive, and non-assignable right to use, solely for its internal non-commercial purposes, patented inventions resulting from the work by the University under said individual project agreement. As for individual project agreements funded entirely by nonfederal money, neither state highway and/or transportation departments nor the United States government with the exception of the Missouri Highways and Transportation Commission shall be granted any such license. The University shall be granted a paid up, irrevocable, nonexclusive, and non-assignable right to the use, solely for its internal non-commercial purposes, patented inventions resulting from the work under this MMU by the Department. Each institutional Participant in a project agreement shall be granted a paid up, irrevocable, nonexclusive, and non-assignable right to the use, solely for its internal non-commercial purposes, patented inventions resulting from the work under a particular project agreement.

(8) EQUIPMENT ACCOUNTABILITY AND DISPOSITION:

(A) All apparatus and equipment purchased or manufactured for which reimbursement is sought shall be used exclusively on an assigned project agreement and shall remain the property of the Commission; however, the Participant shall be the custodian and will be responsible for maintaining current inventories of nonexpendable items until disposition has been made by the Commission.

(B) The Participants shall comply with all applicable Federal and State laws and regulations, including Title 6, Civil Rights Act of 1964 that pertain to affirmative action when purchasing materials, supplies, and equipment for a project agreement.

(C) All major items of equipment and apparatus for which reimbursement is sought and which are not identified specifically and approved as part of the project agreement require written approval by the Commission prior to purchase. A major equipment or apparatus is one costing $5,000 or more, has a life expectancy of two of more years, and does not lose its identity when joined with or made a part of another piece of equipment.

(D) A complete inventory of all nonexpendable equipment and apparatus acquired by Participants under project agreements in conjunction with this MMU shall be submitted to the Commission when requested until notice of disposition has been issued. The following shall be furnished for each inventory item: (a) item name, (b) date of acquisition or manufacture, (c) serial number, (d) make/model identification, (e) Participant's identification number, (f) physical location, and (g) total cost.

(E) Upon completion of a project agreement, arrangements for the equipment's further use on approved research or for its disposal will be made by the Commission.

(9) CHANGES TO MEMORANDUM AND AGREEMENTS: A change to the terms of the MMU shall be valid only if the change is made in writing and executed by the University and the Commission. Changes to the terms of a project agreement shall be valid only if the change is made in writing (electronic documents will be accepted) and mutually agreed to by the University and the Department.

(10) DURATION AND TERMINATION OF MEMORANDUM AND AGREEMENTS:

(A) Duration of the MMU: The MMU shall remain in effect for five years from the date of execution and shall be renewed upon agreement of the parties for each subsequent five-year period, unless either party wishes to terminate the MMU (see termination provisions below.) If either of the parties chooses not to continue the MMU, a written statement to that effect must be provided at least 60 days prior to the last day of the five-year period. The termination will take effect at the end of the five-year period and the MMU shall not be renewed.

(B) Duration of Individual project agreements: Project agreements issued under this MMU shall be for the period specified in each agreement and renewable as described in paragraph (1)((F). Individual project agreements having an effective date or renewal date within the current period of the MMU may extend beyond the termination date of the MMU and the terms of the MMU shall be in force for the duration of that project agreement.

(C) Mutual Termination: Circumstances may arise in which both parties wish to terminate their performance of the MMU or of any individual project agreement. If both the Commission and the University agree to terminate the MMU or project agreement, no new charges/costs can be made to the MMU or project from the mutually agreed upon termination date forward. After the termination date both parties will have 90 days to close out accounts and projects.

(D) Non Mutual Termination: Circumstances may arise when one of the parties seeks to terminate the MMU or a project agreement. Either party may terminate this agreement for cause without the agreement of the other.

(E) If the University wishes to terminate the MMU or a Project Agreement, it shall advise the Commission in writing to the Director, Missouri Department of Transportation, P.O. Box 270, Jefferson City, Missouri 65101.

(F) If the Commission wishes to terminate the MMU or a Project Agreement, it shall advise the University by writing to the Vice Provost for Research, 215 ME Annex, University of Missouri, Rolla, Missouri 65409.

(G) Within 30 days after receipt of a request from either party for termination of the MMU or a project agreement, the other party will provide an appropriate written response. The two parties shall agree upon the termination conditions, including the effective date (which shall be at least 60 days after the two parties agree to termination), and in the case of a partial termination, the project agreement or Agreements to be terminated. The University shall not incur new obligations for the terminated portion after the effective date and shall cancel as many outstanding obligations as possible. The Commission shall allow full credit to the University for any non-cancelable obligations properly incurred by the University prior to termination. In no event shall the Commission be liable for any cost or charge actually incurred after the effective date of termination.

(11) MISCELLANEOUS PROVISIONS:

(A) This MMU constitutes the entire agreement between the parties hereto and supersedes all prior agreements, understandings, and arrangements, oral or written, between the parties hereto with respect to the subject matter hereof with the exception of those existing projects transitioned to MTI as specified in (1)(C) or other pre-existing projects near completion as mutually agreed to.

(B) This MMU, and all project agreements hereunder, shall be governed by and interpreted according to the laws of the State of Missouri, without regard for or application of its conflict of laws rules. The exclusive forum for any and all litigation arising from or relating to this MMU or a project agreement hereunder shall be in a state court or federal court of competent jurisdiction located within the State of Missouri.

(C) The parties hereto, and all Participants under project agreements hereunder, shall be liable only for actual damages for breach of the MMU or a project agreement hereunder, and shall not be liable for any special, consequential, incidental, punitive, exemplary, or indirect damages arising out of this MMU or any project agreement, however caused, under any theory of liability.

(D) If the performance of any obligation under this MMU or a Project Agreement hereunder is prevented or impaired by acts of war, riots, acts or defaults of common carriers, or governmental laws or regulations, the obligated entity shall be excused from performance so long as such cause continues to prevent or impair such performance. The entity claiming *force majeure* excuse must promptly notify the other interested entities of the cause and must at all times use diligent efforts to resume and complete performance.

(E) In the event that a dispute arises between or among the parties hereto or Participants under a project agreement arising from or relating to this MMU or a project agreement, the parties and/or Participants agree to attempt to resolve such dispute through good faith negotiations. In the event that such good faith negotiations do not resolve the dispute within twenty (20) days, the parties and/or Participants agree, at the request of any such party/Participant, to cause (within twenty (20) days of such request) a senior level person with settlement authority within their organizations to discuss the dispute in an attempt to resolve it. If such discussion does not resolve the dispute, the parties/Participants agree, at the request of any such party/Participant, to submit to non-binding mediation before a mutually agreeable mediator. If the parties/Participants cannot agree upon a mediator, one shall be selected for them by the American Arbitration Association.

IN WITNESS WHEREOF, the parties have entered into this Agreement on the date last written below.

Executed by the University this ___ day of _____, 20__.

Executed by the Commission this ____ day of _____, 20__.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION	THE CURATORS OF THE UNIVERSITY OF MISSOURI
By _____	By _____
Title:_____	Title:_____
Attest: (SEAL)	Attest:
_____ Secretary to the Commission	_____
	Title:_____
Approved as to Form:	Approved as to Form:
_____ Commission Counsel	_____
	Title:_____

APPENDIX A

MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION/CURATORS OF THE UNIVERSITY OF MISSOURI
TASK ORDER TO THE MASTER MEMORANDUM OF UNDERSTANDING DATED NOVEMBER 10, 2004

Task Order Contract Number:

Title of Work:

Principal Investigator:

Master Memorandum of Understanding Number: NUMBER (##)

Contract Amount:

Effective Date:

Expiration Date:

Issuing Office of Commission:

Contractor: Missouri Transportation Institute

Mail Vouchers to: Missouri Highways and Transportation Commission
P.O. Box 270
Jefferson City, MO 65102
Attn: Research, Development and Technology

This Task Order Contract is issued under the authority of the Master Memorandum of Understanding between the Missouri Highways and Transportation Commission (Commission) and Curators of University of Missouri (University) and is subject to all applicable provisions and covenants of that Agreement which are incorporated herein by this reference.

The University agrees to furnish and deliver all supplies and perform all services set forth in the attached Special Conditions or the Master Memorandum of Understanding, and any specifications or other conditions which are made a part of this task order contract, by reference or otherwise, the Special Conditions and the Master Memorandum of Understanding shall control. To the extent of any inconsistency between the Special Conditions and the Master Memorandum of Understanding, the Special Conditions shall control.

IN WITNESS WHEREOF, the parties hereto have caused this contract to be duly executed intending to be bound thereby.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION	CURATORS OF THE UNIVERSITY OF MISSOURI

By_____

Title _____

Attest:

_____
Secretary to the Commission

By_____

Title_____

Attest:

_____

Title:_____

SPECIAL CONDITIONS

I. Description Of Work:

The University shall exert its best effort to conduct the research described in Exhibit B - Work Plan, "*Title of Project*," which is incorporated by reference and made a part of this Agreement.

II. Deliverables:

A. Reports. The University shall prepare and submit the following reports to the Contracting Officer:

Report	No. of Copies	Date Due

Interim reports	(as needed)	(stated as needed)
Draft final report	(as needed)	(stated as needed)
Final report	(as needed)	(stated as needed)

III. Designation Of Technical Liaison: (If Applicable)

A. (Name, Title, Address) has been designated by the Commission as the Technical Liaison for this project.

IV. Designation Of Contracting Officer:

A. (Name, Title) has been designated by the Commission as the Contracting Officer for this contract. The contracting Officer is responsible for directing or negotiating any changes in the terms, conditions or amounts specified in this contract. He must notify the University of the Federal sponsoring agency, if applicable.

V. Designation Of Contract Administrator:

A. Wayne Huebner, Vice Provost for Research, 215 ME Annex, Rolla, MO 65409 has been designated by the University to act as its Contract Officer. This individual is responsible for financial and administrative matters of the Master Memorandum of Understanding.

VI. Key Personnel:

The following individual(s) shall be considered key personnel:

Principal Investigator	*Name, title, contact information*
Co-principal Investigator	*Name, title, contact information*
Professional/Technical staff	*As applicable*

VII. Term Of Task Order Contract:

A. Effective date:

B. Completion date:

VIII. Modifications Of The Master Memorandum of Understanding:

None or as applicable

IX. Budget:

A. Exhibit A, which is incorporated by reference and made a part of this Agreement, represents the approved budget for this contract.

X. Payment Schedule:

A. Progress payments shall be made quarterly, in accordance with terms defined in the Master Memorandum of Understanding, Article V – Financial Considerations, upon receipt of invoice from the University.

XI. Other Conditions:

A. Missouri Highways and Transportation Commission Assistance

1. None or as applicable

B. Specifications for reports

1. Project Updates - Commission will require interim reports documenting the understanding(s) reached and issues to be resolved with each of the studies being monitored. (or other text as applicable)

2. Final Report

i. University shall provide two "sample" copies and one "camera-ready" copy of the final report. (or other text as applicable)

ii. "Camera-ready" copy shall be submitted as follows:

a. binding instruction, as needed

b. other special instructions

XII. Contract Complete:

This Task Order Contract, including all items incorporated hereinto by reference or attachment, contains all agreements and covenants between the Curators of the University of Missouri and the Missouri Highway and Transportation Commission. No other understandings, provisions, or materials, whether written, oral, or otherwise, regarding the subject matter of this Task Order Contract, shall be deemed to exist or to bind either or both of the parties hereto.

EXHIBIT A

BUDGET

A. Direct Labor

Principal Investigator
Co-Principal Investigator
Research Assistant
Undergraduate Assistant
Technicians
Secretarial
TOTAL

Fringe Costs on Direct Labor

Faculty
Wages
TOTAL

B. Expendable Material and Supplies

C. Services Phone, postage, printing, rentals, computer time (etc.)

D. Travel _____ (Specify)

E. Special Equipment (Specify)

F. Indirect Cost/Other (Specify)

PROJECT TOTAL

EXHIBIT B

(PROJECT TITLE)

WORK PLAN

Project Number:

Title:

Research Agency:

Principal Investigators:

Objective:

Background & Significance of Work:

Action Plan:

Literature Searches:

Method of Implementation:

Anticipated Benefits:

Funding: SPR etc.

Supporting Data

Procedure:

Staffing:

Equipment:

Budget:

LIST EACH TASK BY: Title or description
Duration:
Deliverable:

Document Findings: Prepare the final report and other technical summaries as

Request for Pre-Proposals
To The
Missouri Transportation Institute
For
Missouri Department of Transportation Projects

The Executive Director of MTI will circulate through the MTI Directors MoDOT's project pre-proposal requests. Interested parties will then be provided the opportunity to submit to MTI pre-proposals on the MODOT project.

The Executive Director and a Technical Review Team will evaluate pre-proposal submission(s), using criteria presented below. Usually only one pre-proposal, based upon the favorable ranking of the Technical Review Team and the Executive Director, will be selected for full proposal development. The selection of a pre-proposal to go forward does not imply or guarantee that the final proposal will be funded.

I. Pre-Proposal Process

MoDOT will request MTI to undertake a project. MTI will issue a Pre-proposal Request for the project and will disseminate it through the MTI Directors. Each request will contain, at a minimum, the following:

- A schedule for response and MoDOT's proposed budget and time frame work.
- Clear statement of the issue.
- MoDOT's definition of project success.
- Specific criteria, if appropriate, for this pre-proposal.
- An opportunity to seek additional information from MTI and MoDOT. If warranted, an informational meeting may be provided.
- Deadline and submission information.

Pre-proposal submissions to MTI are to be in letter form and signed by the Project Team Leaders/Principal Investigators. The cover letter, executive summary, and body of the pre-proposal cannot exceed four (4) single-spaced pages. (Note: standard letter size paper, 1 inch margins, appropriate grammatical form and 11 point font is required.) The submission package must clearly contain all of the following:

- Cover letter – 1 page
    a. Title of the pre-proposal;
    b. Name and title(s) of the principal investigator(s)/team involved in the pre-proposal, including their addresses, e-mail addresses and telephone number(s);
    c. Proposed budget, including the F&A rate of 29%; and,
- Executive Summary – 1 page
- Body of Pre-Proposal with Schedule – 2-3 pages

- Qualifications (maximum of 2 pages per team member)

Upon review of the pre-proposals the MTI Executive Director, after review and consultation with a Technical Review Team, will request one of the proposers to submit a full proposal to MTI.

II. Pre-Proposal Evaluation Process

- MTI will establish a 3-5 person "Project Technical Review Team." Membership will vary depending on the technical material. There will be at least one person from MoDOT. Other members may include: MTI faculty/staff from a university not submitting a proposal, someone from the consulting industry or another state DOT, or out of state university. Review Team members will be required to sign a no conflict of interest form.
- The Technical Review Team will be provided with the project pre-proposal request.
- The Technical Review Team will provide the MTI Executive Director with an analysis of the pre-proposal and a recommendation. The recommendation will rank the pre-proposals, indicate those proposals that are acceptable for award and the strengths and weaknesses of the proposals.
- Considering the recommendation of the Technical Review Team, the Executive Director will make a recommendation to MoDOT on the project pre-proposal and forward it to MoDOT.

III. Basic Criteria and Weights for Pre-Proposals:

These are the basic criteria and weights. Additional criteria may be established that are specific to a particular project. These criteria will be used by the review team. When appropriate, additional weight may be given to multi-university and interdisciplinary teams. The basic criteria and weights are:

- Understanding of the scope/purpose and goal of the project/research request, and schedule (40%);
- Correlation of the research in attaining MoDOT's tangible results, MoDOT's definition of project success and the value of the proposal to the citizens of the State of Missouri (10%);
- Clarity and completeness of the proposal (20%);
- Quality of the project team/principal investigator, including past performance (20%);
- Implementation opportunities (10%);

Optional elements that will be considered on some proposals, where appropriate:

- Value of the proposal beyond tangible results and citizens;
- Multimodal opportunities; and,
- Multi-university and/or interdisciplinary opportunities.

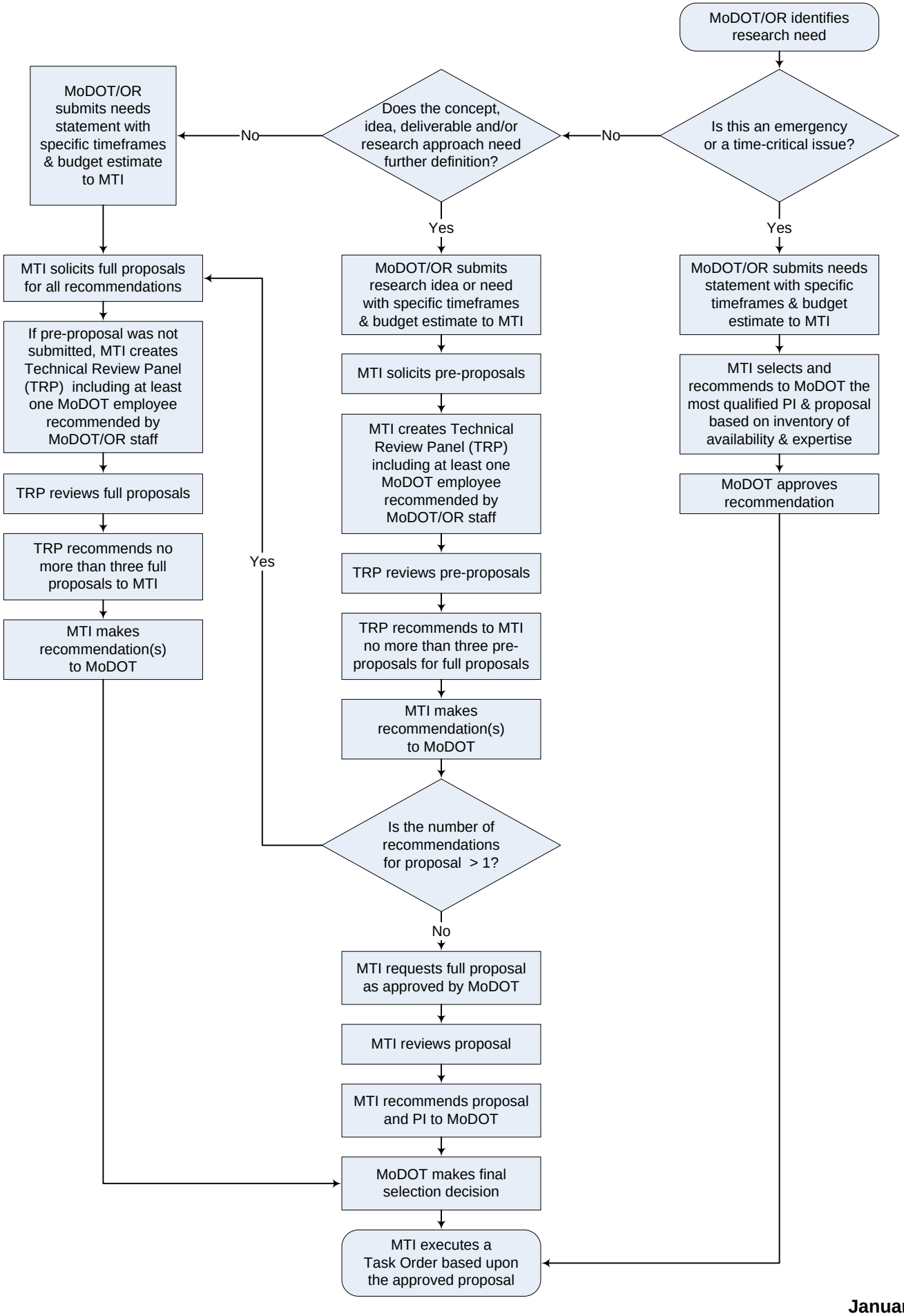
IV. Submission of Pre-Proposals

Letters are to be submitted in electronic .pdf format to the university's MTI Director and to William D. Ankner, PhD at ankner@umr.edu. One faxed copy of the pre-proposal with the original signature of the principal investigator(s)/team must be sent to the university's MTI Director and Dr. William D. Ankner at (573) 341-7639.

All pre-proposal submissions (electronic and faxed) must be submitted before the closing deadline. Any submission missing the deadline for whatever reason will not be reviewed.

No letters are to be sent to MoDOT.

MoDOT/MTI Research Proposal Process



Process Agreement Regarding
Unsolicited Research Ideas/Problem Statements
Between MoDOT and MTI

Effective June 1, 2005
Revised January 3, 2006

We, as partners, fully understand that over any course of time, research ideas/problem statements can germinate. Therefore, it is imperative that MoDOT and MTI concur on a specific process that articulates how these unsolicited research ideas/problem statements can get evaluated by the department and incorporated with the process to create MoDOT's annual work program. An unsolicited research idea/problem statement is defined as any research ideas/problem statements that are outside of the approved, annual work program.

The emphasis is on the idea or problem to be addressed and not the solutions. **Solutions to the problem should not be part of the submittal.**

Process:

1. The author will complete the attached research idea/problem statement form.
2. MTI will review the completed form and work with the author to refine the research idea/problem statement.
3. MTI will forward to MoDOT's Organizational Results (MoDOT-OR) Division the refined research idea/problem statement.
4. MoDOT-OR will review the research idea/problem statement and will determine if the research idea/problem statement is something that will impact MoDOT's Tangible Results
5. If MoDOT-OR determines the research idea/problem statement has merit, MoDOT-OR will then market the idea/problem statement to a champion within the department
6. Once the MoDOT champion and the MoDOT-OR representative agree the research idea/problem statement will benefit MoDOT, MoDOT-OR will contact MTI with an approved problem or needs statement.
7. If contacted by MoDOT to proceed, then MTI will solicit pre-proposals or proposals to address the needs/problem statement.

Missouri Department of Transportation
Organizational Results
Idea and/or Problem Statement

Proposed idea and/or problem statement:

Goal and/or objectives:

Value to MoDOT and the residents of Missouri:

What is the result and how will it help the department?

Implementation:

What will the product look like and how will MoDOT apply it?

Indicate what Tangible Results this idea and/or problem statement relates to:

☐ Uninterrupted Traffic Flow, Convenient, Clean & Safe Roadside Accommodations, Attractive Roadsides, Efficient Movement of Goods, or Roadway Visibility

☐ Partner With Others to Deliver Transportation Services, Leverage Transportation to Advance Economic Development, Innovative Transportation Solutions, Easily Accessible Modal Choices, or Customer Involvement in Transportation Decision-Making

☐ Personal, Fast, Courteous & Understandable Response to Customer Requests (Inbound), Best Value for Every Dollar Spent, Advocate for Transportation Issues, or Accurate, Timely, Understandable & Proactive Transportation Information (Outbound)

☐ Fast Projects That Are Of Great Value, Environmentally Responsible, Smooth & Unrestricted Roads and Bridges, or Safe Transportation System

☐ Other. Please specify:_____

Missouri Department of Transportation
Organizational Results
Idea and/or Problem Statement

Name: _____ Date: _____

Title: _____ Phone: _____

Organization: _____ E-mail: _____

Address: _____

_____

Complete and Return to:
Missouri Transportation Institute
710 University Drive
Suite 100
Rolla, Missouri 65409-1470
Phone: (573) 341-7638
Email: rylem@umr.edu

Research Final Report Format

Cover: ***(Completed by General Services)***

Title Page: *(Includes acknowledgments and disclaimer. The portion of the disclaimer that refers to FHWA should be omitted if federal funds are not involved.* ***(See j:\div\divman\Title.dot or p:\rdt\divman\Title.dot****)*

FHWA Form 1700.7: *(If the investigation used FHWA funding.* ***(See j:\div\divman\form1700.dot or p:\rdt\divman\form1700.dot)***

Acknowledgments: *(Thanks to people also working on this study.)*

Executive Summary: *(Generally, one page or less to convey the purpose of the study and to list the conclusions and recommendations produced.)*

Table of Contents:

List of Figures:

List of Tables:

Introduction: *(This is the first numbered page. Describe the problem including its background and history of research. Include why it is important to MoDOT.)* Note Literature Review Information.

Objectives: *(Keep information in this section to the point. Could consist of list of objectives, if necessary.)*

Discussion of Present Conditions: *(Need to explain what we now do and why the research or evaluation will help. Keep short.)*

Technical Approach: *(Details of test methods used, mix designs, etc.)*

Results and Discussion (Evaluation): *(This should follow the same sequence as objectives listed.)*

Conclusions: *(Detailed and based on the work performed in the research investigation or new product evaluation. Put in the same order as objectives are listed.)*

Recommendations *(Detailed and based on the work performed in the research investigation or new product evaluation. Put in the same order as objectives are listed..)*

Implementation Plan: *(A discussion of the findings from the study should detail how the*

Principal Investigator feels the results of the study should be implemented into practice or production.)

Principal Investigator and Project Members: *(List all names, their title and responsibility for each.)*

Implementation Objective: *(Briefly identify how the evaluation should be applied to MoDOT applications. What benefits do you expect?)*

Affected Divisions and Principal Contact: *(List all divisions that will be affected with the implementation and a principal contact for each division.)*

Implementation Period: *(Establish a time to begin and end implementation. Establish milestones to measure progress.)*

Funding: *(Where will the funds come from? Function code to charge time and related expenses.)*

Technology Transfer: *(Literature dissemination, training, demonstrations, pilot projects, conferences, library display, and entry of results into division and national databases.)*

Procedure: *(The order of work, step by step of what will happen. This should be in detail. Identify the work, who is responsible, and with what divisions. Dates for each step should be listed. Is training necessary? This information should be complete that a schedule diagram can be drawn from it.)*

Budget: *(Personnel estimate of time converted to wages. Any other costs?)*

Bibliography: *(Including any previous interim reports from this study.)*

Appendix A Work Plan